

## SCALE DEVELOPMENT AND SCALE TESTING OF STUDENT'S ENTREPRENEUR SELF-EFFICACY (SES): PRELIMINARY PSYCHOMETRIC TEST

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**ABSTRACT.** *Entrepreneurial Self-Efficacy is the degree to which individuals identify themselves as having the ability to accomplish the numerous roles and responsibilities of entrepreneurship effectively. This paper aims to develop and validate the scale to measure commerce and management graduates student's Entrepreneurial Self-Efficacy. We have used various validation techniques like face validity, logical validity, construct validity, criterion and discriminate validity to make our questioner standard. The factor analysis is used to handle the factors in the constructed scale. With the use of reliability of scale and factors analysis, the six factors present in the scale are finalized. The six factors are developed here are as a Product (13 Questions), Build innovative environment (5 Questions), Investor relationship (13 Questions), Define core purpose (07 Questions), Handle unexpected challenges (21 Questions), and Develop HR (15 Questions). We have made the Questionnaire of 74 questions and then validate it to test the Student's Entrepreneur Self-Efficacy among commerce and management graduates.*

**Keywords:** Scale Development; Entrepreneurship; Scale Testing; Psychometric Test.

**1. Introduction.** Social Cognitive Theory describes Self-Efficacy in the form of individual's ability to execute certain plans/strategies needed to achieve a result [11]. It is the idea of one's ability to organize and implement a particular plan/strategy about the estimated outcome or decision. This theory emphasizes the idea as the most prominent among the cognitive factors that affect working of a human. The idea of Self-Efficacy plays a major role in the group of individuals. At this point, when the individuals do not believe that his work will not have desired results, then there may be little motivation for them to include in the undertaking or be in troubles. Their actions are based on what the person thinks and believe in what actually exists. Social cognitive theory has also proved Self-Efficacy itself as a determinant of individual performance (Bandura, 1986) [7].

Student's entrepreneurial Self-Efficacy is classified into different dimensions, in which the Bandura (1986) domain consists of six subscales corresponding to the development of the proposed enterprise-specific self-skill measures [7]. The six dimensions are A) Develop product and market scopes B) Build an innovative environment C) Initiating investor relationships D) Define core purpose E) Cope with unexpected challenges and F) Develop critical Human Resource.

In a study, Ismail et al. (2009) mention that age, sex, education, work experience and role models as factors affecting entrepreneurship [4]. The study by Berglan et al. (2011) found that the propensity towards business enterprise is beneficial and increase the income diversification and for turning into an Entrepreneurial

individual, family assets (i.e. income), sex and workplace are communicated [5, 8]. Chandler and Jensen (1992) completed a study in which individuals were questioned about their ability to execute the skills needed to be effective in entrepreneurship, managerial and technical-functioning roles [6].

Prime Minister Narendra Modi on 5th April 2016 to promote entrepreneurship between Scheduled Castes, Scheduled Tribes, and women. Rs. 10 lakh to Rs. 100 lakhs and its purpose is empowering the deprived sections of society [9]. Former President Dr. A P J Abdul Kalam quoted that “ India should start entrepreneurship program in the academic curriculum. The educational system should add the courses of entrepreneurship; Students from school to college are required to acquire such skills that can provide independence” [10].

In this paper, we try to explore the construction and validation of a tool developed to test the student's entrepreneur Self-Efficacy & the six dimensions of it.

**2 . Materials and Methods.** In this section, we have discussed scale construction, Statement Pool Creation, Face Validity, Logical/Content Validity, Construct Validity, Criteria Validity, and Discriminant Validity.

**2.1. Scale Construction:** Scale development is an essential stage in the assessment of constructs and variables in behavior, medicine, social and biomedical science. We have discussed the theoretical principles, practices, and concepts to increase the validity of Variables and Constructs assessment. First; we should clear about the concepts of constructs, what are the main items in it and wording of each item should be clear. Second; the items should be tested related to constructs, and it should be represented the entire target population. At the third; dimensions of items are more important than the internal connection between items, and for scale construction, factor analysis is going to play a significant role for the dimensions and discriminations of variables and constructs.

**2.2. Statement Pool Creation:** After defining the scope and range of the domain, the next important task is to create the most appropriate valid items of the constructs. It is a very crucial stage of scale development. The primary objective of this stage is to collect and list the most relevant items of the specified domain.

**2.3. Face Validity:** The face validity is to the extent, for which a test is viewed in the form of covering the concepts in a topic that is ready to measure it. It refers to the transparency or relevance of a test because it appears to be tested by participants [3]. Face validity assumes that the test “seems to be valid” to the test takers, whether administrative personnel decided to use it and other technically untrained supervisors. In this study out of 420 statements were listed initially. However, after screening with the help of experts, only 74 most appropriate statements were selected using face validity.

**2.4. Logical / Content Validity:** It refers to the extent to which a measurement shows all aspects of a given construction. It denotes to the degree to which a measure shows all aspects of a given construction. The four subject experts accessed content validity: academicians, statisticians, psychologist, and entrepreneurs. The purpose behind is to separate the variables which are having more agreements among this four experts.

**2.5. Construct Validity:** Construct validity “is a degree in which a test measures, which claims it, or intent, to measure” [1]. This degree is an integrated evaluation decision in which empirical evidence and theoretical rationality tests support the adequacy and fairness and suitability of tasks on the basis of marks [2]. Convergence validity refers to the degree in which two theoretically related measures should be formed, actually related.

For testing the Construct Validity, a pilot test was conducted in which 100 students (50 boys and 50 girls) of commerce and management graduates students involved. Our final questionnaire contains 74 questions with six different dimensions of Entrepreneurial Self-Efficacy.

**2.6. Criteria Validity:** This is to the extent, for which a “measure” is related to a result. The validity of the criteria is often divided into concurrent and predictive validity. Concurrent validity compares the comparison between the measurements in the question and at the same time assesses a result (same time). On the other hand, the validity of the prophecy compares the measurements with the results of the assessment (later time).

To check the criteria related validity, 74 statements in Likert scale 1 to 5 points for 100 students (50 boys and 50 Girls) from commerce and management graduates.

**2.7. Discriminant Validity:** The discriminant validity applies to two different cadres, which are easily differentiated and for such validity, the factor analysis technique is used. Factor analysis is a statistical method, which was observed in terms of the potentially small number of variable variables known as “factors,” describes variability between correlated variables. This technique used for data reduction. We have given 100 questionnaires to the commerce and management graduates of MBA, BBA and BCOM students.

**3. Analysis.** In this paper, we have chosen 420 statements for the item pool which are going to helpful for defining the constructs. These constructs will measure the Entrepreneurial Self-Efficacy among the commerce and management graduates. The statements, which are not relevant to our study, were discarded, and only 74 statements are the result of the filtration for this study. We have used the five-pointed Likert scales in the questionnaire.

At starting 420 statements were chosen and with the help of experts, only 74 statements are filtered with the use of face validity. As we have 420 statements, so we gave the questionnaire to four experts, which include academicians, statisticians, psychologist, and entrepreneurs. If there will be too many statements in scale, then it will be problematic for the respondent students, as it might misguide them. When we remove statements from the scale, one can always consider the content validity.

We have use face validity, content validity and criterion validity to modify the questionnaire. In the final version of the questionnaire, there are two sections. In the first section, general basic information asked, and in the second section, 74 questions about six factors of student’s entrepreneur Self-Efficacy are listed. As we use a Likert scale, it will be easy for students to answer. Then the reliability and validity are tested of a questionnaire to maintain the standard.

We conducted this pilot work to find out the approach of research to know about what problems arise while developing and validating the scale. Suitable instruments and data collection method are very much relevant, as they will ultimately create a base for the development of the scale Statements. The mentioned, Reliability was done using the pilot study.

Table. 1. Reliability testing of Scale

Student’s ESE Factors	Number of Items	Max Score	Correlation	Reliability Index	P Value	Remark
Develop product	13	80	0.7281	0.8483	<0.001 **	High reliable
Build innovative environment	5	80	0.7510	0.8633	<0.001 **	High reliable
Investor relationship	13	70	0.6552	0.7900	<0.001 **	Very reliable
Define core purpose	7	70	0.7049	0.8347	<0.001 **	High reliable
Handle unexpected challenges	21	60	0.6552	0.7900	<0.001 **	Very reliable
Develop Human Resource	15	60	0.7049	0.8347	<0.001 **	High reliable
Total	74	420	0.7707	0.8705	<0.001 **	High reliable

A criterion-referenced test is a style that is used to generate a statement about the behavior of test scores, which can be expected by the student/individual with that score. This is employed in this study to which particular factor affected on the student’s Entrepreneurial Self-Efficacy and gives enormous effect on students.

**3.1. Factor Analysis:** Factor analysis is a statistical method that has been used, which describes the variability between correlated variables, in the context of the probable low number of unobserved variable called ‘factor.’ It can be used to simplify the data for analysis. It is also used to build and operate scale. In such a case, the scale has been specified in advance, and we know that a

special sub-set of the scale represents an independent dimension within this scale. In our paper, we use Confirmatory Factor Analysis which is most often used in structural equation modeling.

Table. 2. Confirmative Factor Analysis for Scale Measurement of ESE among Commerce and Management Graduates

Statements	Total Correlation	Factor 1	Factor 2	Factor 3	Factor 4
Student has skills to look at new market scopes for new products and services.	.839	.513	.149	.809	.257
Student has skills to find new ways to advance on existing products.	.802	.797	.801	.300	.141
Student has skills to classify new areas for potential development.	.844	.879	.027	.031	.003
Student has skills to plan on products that solve ongoing problems.	.888	.843	.004	.036	.085
Student has skills to make products that satisfy customers' unfulfilled requirements.	.845	.828	.100	.015	.033
The student can bring product concepts from time to time in the market.	.829	.821	.098	.034	.067
Student has abilities to figure out what the business will resemble.	.871	.858	.008	.024	.032
Student has good knowledge of the product or service.	.058	-.041	.053	.047	.181
Student has sound technical knowledge for Product /service development.	.832	.828	.067	.002	-.005
Student thinks that it is hard to accompany new, inventive or innovative ideas.	.259	.170	.090	-.004	.045
Student gets very excited when he/she think of new ideas to model his/her business.	.107	-.231	.126	.050	-.024
The student believes it is valuable to look for better approaches to doing things in business continually.	.250	.166	.521	-.060	.004
Successful entrepreneurs always experiment with new ideas of business.	.010	.001	.006	.089	.255
The student has skills to create a workplace that lets individuals be more their manager.	.888	.858	.116	.077	.134
The student has skills to build up a workplace that motivates individuals to experiment with something new.	.843	.846	.107	.012	.241
The student has skills to motivate individuals to take leads and duties for their ideas and outcomes.	.897	.068	.004	.865	.170

Student has skills to form accomplice or partnership association with others.	.885	.203	.049	.838	.192
Student hardly waits and watches things happen; he/she want to get things done.	.824	.811	.043	.067	.101
Student has skills to develop and maintain favorable relationships with potential investors.	.083	.394	.260	.014	.312
Student has skills to develop and maintain favorable relationships with potential customers.	.196	.094	.658	.026	.123
The student has skills to create associations with the major individuals who are associated with capital sources.	.844	.821	.456	.247	.101
Student has skills to identify potential base of financial investment.	.834	.815	.143	.465	.101
Student has lots of money to start a business.	.396	.294	.158	.236	.113
Student has knowledge about many institutions providing finance for new business	.823	.813	.654	.397	.456
Student has knowledge about financial schemes and policies like startup India etc. of government for entrepreneurs.	.845	.836	.463	.345	.235
Student sounds good at collecting fund and individuals to start a new organization or new program.	.876	.439	.834	.165	.634
Student attempts to make companions with individuals who might be helpful in his/her business.	.234	.256	.278	.520	.158
Is student aware of the various promotional agencies helping Small Scale Industries?	.120	.156	.256	.167	.145
Is student aware of the concessions given to SSI units?	.390	.143	.270	.340	.278
Is student aware of commercial banks' lending to the Small Scale Industries?	.460	.155	.124	.324	.543
Is student aware of the various technical institutions that are extending technical advice to Small Scale Industries units?	.156	.324	.256	.111	.231
Is student aware of the problems of Small Scale Industries units?	.348	.265	.234	.435	.267
Student has skills to clear vision and values of the organization.	.850	.598	.345	.678	.456
Student has skills to motivate others to encompass vision and values of the organization.	.869	.356	.367	.278	.290
Student has skills to figure out a set of actions in quest of scopes.	.821	.170	.165	.198	.256
Student builds the business scopes; he/she	.845	.256	.342	.267	.278

take the benefit of.					
Are you familiar with the functions of Small Industries Development Corporation in your State?	.878	.543	.456	.389	.674
Is student aware of the export and import policies of Government of India?	.887	.146	.148	.189	.210
Is student aware of the Role of District Industries Centre in your district?	.268	-.094	.958	-.056	.113
Student has skills to work productively under nonstop anxiety, weight, and strife.	.848	.823	.780	.160	.234
Student has skills to bear startling changes in business conditions.	.158	.034	.245	.235	.567
Student has skills to continue even with misfortune.	.859	.234	.456	.789	.854
Student likes challenges that that truly extend his/her capacities as opposed to things he/she can do effectively.	.844	.554	.056	.258	.812
When student faced with a challenge, he/she think more about the result of succeeding than the effects of failing.	.823	.445	.810	.178	.145
Student takes enjoys in responding to challenges.	.820	.805	.345	.267	.168
The student does not care even if the profit is small, but he/she will work harder so that it is assured and constant.	.833	.167	.157	.258	.823
While others see nothing unusual in ideas, student see scopes for business.	.867	.389	.167	.256	.854
The student does not have difficulty working under uncertainty unless there is a possibility of profit in the future.	.815	.567	.258	.813	.234
Student enjoys working in untimely conditions and face challenges.	.177	.469	.456	.675	.456
The student believes that there are always new and better ways of doing things.	.279	.563	.122	.045	.322
Student will consider taking a risk if the success rate will be 60% or more	.170	.579	.835	.258	.231
Student is afraid to participate in or join a new venture, he/she does not know anything about this	.235	.456	.256	.278	.419
Student can think many times when he/she will continue to work when others quit.	.327	.123	.423	.267	.623
In unclear situations, student like to take a lead and make decisions.	.201	.012	.456	.345	.239
The student enjoys finding a good solution to those problems which no one has yet seen.	.834	.400	.156	.246	.820
When student does not complete any meaningful work, he/she feels sad.	.279	.345	.378	.523	.447

The student believes that it is important to question the perceptions created to define the problem to reach a good solution to the business problem.	.377	.289	.013	.342	.278
The student looks for someone for a long time, who can tell him/her how his/her whole business problem can be solved.	.146	.094	.258	.056	.113
Is student confident of finding solutions to problems of Small Scale Industries units?	.239	.126	.558	.076	.313
Is student aware of the following Institutions and its functions/role?	.365	.298	.958	.056	.613
Student has skills to recruit and provide training core employees.	.823	.574	.958	.056	.811
The student has the skills to develop a contingency plan to meet the major technical.	.855	.288	.644	.356	.843
Student has the skills to identify skills and build team management.	.167	.234	.158	.045	.334
When student in a group, he/she like to take the lead.	.296	.334	.458	.156	.277
Student usually not defends my views if someone disagrees with me.	.866	.456	.158	.056	.809
It is more important to work well than to try to please individuals.	.893	.399	.858	.012	.206
The student would rather work with someone he/she does not like, but who is excellent at the job, than with someone he/she like, but who is not good at the job.	.873	.259	.823	.236	.567
Student accomplishes most when he/she single handedly direct a team.	.312	.291	.811	.056	.456
The student believes in their ability to lead the team.	.845	.664	.838	.456	.345
Student will first recruit on the basis of individual's relationships on their own potential.	.488	.194	.858	.056	.355
The student believes that the most important thing in choosing their business colleagues is their ability.	.867	.303	.238	.453	.859
Student often put on the show to impress students' work.	.226	.194	.358	.829	.380
Student feels uncomfortable when he/she unsure of what his/her business colleagues think of himself/herself.	.876	.845	.258	.356	.213
Student follows his/her own instincts when facing adversity.	.196	.034	.558	.356	.346
Siblings in the business help students to decide to go for own venture.	.226	.128	.958	.656	.225

**4. Conclusion.** In this paper, the primary objective of our work is to design and evaluate the scale for student's Entrepreneurial Self-Efficacy for commerce and management graduates where all the developed scales were evaluated statistically. We have used face validity, construct validity, criteria validity, and logical validity to standardize the scale. Using the factor analysis six dimensions or factors were identified such as A) Develop product and market scopes B) Build an innovative environment C) Initiating investor relationships D) Define core purpose E) Cope up with unexpected challenges and F) Develop critical Human Resource. This scale can be used to measure the student's Entrepreneurial Self-Efficacy among the commerce and management graduates.

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